

Sound Treatments for Good Health

Vibration permeates everything, and sound affects everybody, whether we realise it or not.

Here, we explore two approaches to the use of sound in improving health.

Based on material supplied by

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1. THE TOMATIS® METHOD GETS A WIDER HEARING

How seriously should we take the modern menace of noise pollution? Last year (1991), environmental health officers in Britain received over 100,000 complaints about noise, while the US National Institute of Health estimated that more than 10 million Americans are regularly exposed to noise levels that could cause hearing loss, with discos and personal stereo systems the chief causes for concern. Potentially most harmful, therefore, are the 'recreation' sounds we purposely seek and depend on for pleasure and escape, or the everyday urban cacophony to which we eventually become impervious. As Professor Chris Rice, Director of the Institute of Sound and Vibration Research in Southampton, points out, the real danger is that "you don't become accustomed to noise, you become deaf to it." And if not deaf, then functionally impaired in other subtle, less obvious ways.

According to Europe's leading pioneer in the field of Audio-Psycho Phonology (APP)—the study of the relationship between ear, voice and psyche—although hearing is probably the first of our senses to develop, it remains the least researched and understood and is taken largely for granted by all except those with diagnosed hearing problems. Yet having devoted a lifetime to analysing and improving the function of the human ear, Professor Alfred Tomatis concludes that the most powerfully far-reaching of all the senses generally remains the most defective.

The eponymous Tomatis 'method' seems at first to be informed as much by New Age philosophy as medical science. The apparent unorthodoxy of some of Tomatis's views—for instance, that from four-and-a-half months the foetus begins listening to its mother's voice, distinguishing it from the background of visceral rumblings, and becomes dependent on an intra-uterine 'dialogue' which then develops throughout infancy—belies his background as a practising ear, nose and throat (ENT) specialist with 45 years' experience of successful treatment of learning, audio-vocal and behavioural problems.

In the 150 centres around the world—where Professor Tomatis's 'listening cure', pioneered in his Paris clinic, is now available—teachers, musicians, psychologists and speech, music and occupational therapists are successfully applying the technique to a variety of learning and communication disorders. Tomatis's thesis, which is that all communication or learning disorders have their origins in impaired or under-developed listening skills, is gaining credibility among others working in the field of speech and hearing. Such disorders as illiteracy, stuttering, dyslexia, inability to learn languages, impaired concentration and memory, lack of verbal fluency or coherence, as well as more generalised problems including depression, fatigue and shyness are, according to Tomatis, linked to an impairment in auditory skills which causes us to become disconnected from our environment and so unable to communicate as well as we might with the outside world.

The crucial distinction between hearing (essentially a passive sensory process of absorbing sound) and listening (the voluntary focussing on specific sounds), is integral, says Tomatis, to the understanding of how and why 'natural' self-expression and communication often falter or break down altogether. Even non-vocal skills such as writing, which translates sounds into graphic form, may suffer if the sounds of language are poorly integrated. In extreme cases, withdrawal from normal life and communication may be chronic, as in the case of the actor Gérard Depardieu, who, until coming to Tomatis in his late teens, had been too inhibited to talk freely with other people.

The son of an opera singer, Tomatis has an innate musical ear. It was his early experi-

ence as an ENT specialist, working with hearing-impaired factory workers and, more significantly, with opera singers including Maria Callas, which first instilled the belief that chronic vocal problems may be caused not by structural deformities in the larynx but by listening to one's own voice—a mechanism he calls "self listening". This convinced him that one can reproduce vocally only what one's ear can hear. By analysing his patients' hearing he discovered that not only does each person possess a unique auditory curve—its peaks and troughs indicating which parts of the sound spectrum the ear registers more or less clearly—but that those frequencies we hear least or not at all always correspond to the range we cannot easily reproduce when speaking or singing. This discovery was formally recognised as the Tomatis Effect by the French Academy of Sciences in 1957.

Because of its direct neural connection with the left hemisphere—the side of the brain that governs logical thought-processes and activities including speech—the right ear normally is, or should be, the dominant or 'leading' ear: the 'musical' ear in the case of singers and musicians. The right ear therefore plays a crucial role in the vital feedback loop between speech or song and the act of listening. Any imbalance or interference with the function of the right ear causes the voice to become distorted and speech to lose its fluency.

By fine-tuning his electronic equipment, Tomatis was able to identify the crucial role of high-frequency sounds, from 4,000 cycles per second (Hz) upwards, in listening and speech. Lack of vocal fluency, musicality or tone becomes most noticeable when we are exposed primarily to low frequencies—for example, when the bass on a stereo system is turned right up—to which the left ear appears to be chiefly attuned. Such ill-effects become more pronounced when the higher frequencies, to which the right ear is most sensitive, are diminished or screened out altogether. Since the high-frequency band—typically between 2,000 and 4,000 Hz—covers the upper range of the human voice in most languages, giving it its timbre, the degree to which this is, or is not, picked up by the ear is obviously crucial to the ear-voice feedback theory.

The implications of his discovery for foreign-language students is intriguing, since it suggests that there is a sound scientific basis for the lack of a 'good ear' for languages which no amount of traditional learning can alter. According to Tomatis's findings, each nation possesses a collective ethnic 'ear', and inhabitants' spectrum of hearing is governed by a 'preferred frequency' which is also reflected in their speech. Thus the German 'ear', says Tomatis, hears between 100 and 3,000 Hz; the French between 1,000 and 2,000; the English between 2,000 and 12,000; the American between 750 and 3,000. The apparent ease with which the Slavs master foreign languages is due to their extraordinarily broad range of hearing, from 100 to 8,000 Hz. "Their aptitude is more for hearing than for speaking," he explains. The theory could explain why, for instance, the French experience difficulty in tuning into the English but not the American ear: the American band peaks at 1,500 Hz, not far removed from that of the French.

The success of his method as a linguistic aid comes from teaching students to modify their hearing, and so adapt their way of talking to correspond to the frequency range of their chosen language. The fastest, most effective way of doing this, says

Tomatis, is to make students listen to tapes made up of sounds, rhythms and frequencies specific to a given country. In order to become attuned to American speech sounds and rhythms prior to filming *Green Card*, Gérard Depardieu again consulted Tomatis, this time to undergo an American-style 'sonic rebirth'.

Although Tomatis's method is now increasingly applied by teachers and therapists to improve performance in language and vocal skills and to treat children's learning disabilities ranging from dyslexia and poor concentration and memory to disorders such as stuttering and even autism (which Tomatis interprets as the ultimate expression of a child's refusal to listen), many of its underlying theories remain controversial. Professionals struggle, for example, with his view of the ear as not merely an instrument for hearing and maintaining balance, but as a generator which uses sound's vibrational energy to charge the entire organism via bone, viscera and neural impulses—in particular, stimulating cortical energy and brain activity and so providing the motivation for speech, communication and learning.

Because the tiny sensory hairs in the inner ear are far more dense in the area which responds to high frequency than in that reserved for the low range, Tomatis claims there can be little mystery as to which sounds possess the greater energising properties—or why. "It is well known that the auditory apparatus acts as a charging or energising dynamo," Tomatis told me. "It furnishes

the current to feed the brain." He uses a combination of Mozart's music and Gregorian chants throughout all stages and applications of his method since he claims that their rich harmonic structure and predominant high-frequency range possess a unique generating power.

Could the ear also act as a regulator of other bodily functions, as Tomatis believes? Given that almost all cranial nerves lead to the ear, this is perhaps not as fanciful as it sounds. Tomatis is not the only person to make the connection between listen-

ing to music, chanting or singing, and feelings of improved well-being and greater energy. In England, sound therapist Jill Purce has long recognised and applied the healing benefits of sound and Tibetan overtone chanting to treat a host of physical and psychological ills. According to Tomatis, the most plausible rationale for these positive effects is that all the vital organs and processes are influenced by the ear through their tie-in with the tenth cranial nerve, which directly and indirectly, via branch lines, links the ear to every other organ in the body. Unusual as it may be, this perspective of the ear illustrates why so many 'bad listeners' not only have speech and learning difficulties but also, along with their flat, colourless voices, suffer more generalised symptoms of fatigue and depression, and faulty coordination, balance and posture. It also indicates why improvement in mood and energy levels is one of the most immediately noticeable effects of the training program—in which Tomatis's invention, the "electronic ear", superimposes 'perfect' hearing, allowing the patient to listen to music, speech or their own voice, but electronically doctored to emphasise the higher frequencies until their own ear is sufficiently conditioned to pick these up naturally.

But how and why do so many of us become bad listeners in the first place? According to Billie Thompson, Director of the Sound, Listening and Learning Center in Phoenix, Arizona, 'good' listening may be impaired at any age, through accident, emotional

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shock, illness, lifestyle changes, or trauma suffered before, at or after birth, thus weakening the mother-child audio-vocal link that forms the foundation for the child's later acquisition of language and communication skills. "The inability to hear the natural mother's voice may have a traumatic emotional impact on infants," she asserts, "whether due to a physiological difficulty caused by developmental delay, or because the mother is not there with the child due to some extended separation such as adoption, illness or even death." Such an experience may prevent the infant from responding to certain sounds, including speech, ever afterwards—something APP specialists identify as an instinctive protection mechanism against sounds that are too loud or associated with experience of trauma.

Physiologically, this protection mechanism manifests itself through gradual loss of elasticity of two tiny muscles, the *stapedius* and the *tensor tympani*, which are connected to the hammer and stirrup ossicles of the middle ear, and eventually the loss of tone necessary to perceive and differentiate between sound frequencies. The principal function of the electronic ear is to condition these muscles to respond to all frequencies more efficiently and to encourage dominant function of the right ear. As listening skills improve, students participate more actively—speaking, reciting, singing, chanting—while listening to the feedback of their own electronically 'improved' voices until they spontaneously and naturally reproduce those desired sounds. As listening improves, so do the quality, modulation, fluency and articulation of their speech.

Apart from its obvious advantages for singers, musicians, linguists, actors and anyone dependent on good communication skills, the method is particularly valuable in overcoming learning difficulties. The structure, content and length of programs

varies—average is 30 days of listening sessions spread over several months—but almost all commence with a recreation of the earliest stages of auditory and language development to overcome blocks caused by early trauma. This includes simulated sounds of the womb and a sonic 'birth', based on filtered recordings (if possible) of the mother's voice, the chief instigator of a child's desire to communicate with the outside world. Students then progress to listening to tapes incorporating rhymes, chants, folk songs, vocal exercises, and phonemes—the building blocks of language—played at progressively higher frequencies. Finally, the student reads or sings aloud under the electronic ear to reinforce his audio-vocal control.

Underscoring all of this is the Mozartian leitmotif, as an aid to receptivity, relaxation and motivation. Buy why Mozart? Decades of research show that despite their beauty, the works of other composers do not improve auditory skills, concentration and alertness.

On the contrary, Chopin tends to encourage day-dreaming and absent-mindedness linked to learning disabilities; Beethoven can deepen feelings of depression and melancholic withdrawal; while Paganini, Wagner or military marches may over-arouse children to irritability, aggression and hyperactivity. Most destructive, warns Tomatis, echoing other sound researchers, are the new 'sonic drugs'—loud rock music, personal stereos—which hypnotise and heighten bodily sensation by low-pitch stimulus while destroying the ear and its functions, isolating us from our environment and shattering any desire to communicate. When tempted to shut out the world in this way, we would do well to remember the possible cost of escape.

(This article, written by Alix Kirsta, was originally published in VOGUE, Paris, June 1992 edition.)

**There are about 250 Tomatis Centres in the world.
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**SOUND AS A MODULATOR OF CONSCIOUSNESS
by Tom Kenyon, M.A.
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The Vedic Rishis of ancient India coined a term that conveys their experience of the world as vibratory in nature. The term *nada brahmin* means literally "the world is sound". And modern quantum physics would agree with this basic tenet.

The science of *mantra*, which has evolved over thousands of years, directly seeks to affect consciousness itself and, in some cases, matter, through the use of specific vibratory keys. These vibratory keys or *bijas* (seed sounds) can profoundly affect awareness.

In my own work with groups and individuals I have found that the use of mantras or chants can seemingly transport one to other dimensions of consciousness. I have also found that these vibratory keys work even if they are not inherent in the culture of the participants. I use, for instance, mantras and chants from numerous traditions including Buddhist, Christian, Hebrew, Hindu, Moslem as well as from indigenous cultures. All of these have the ability to affect people profoundly.

Empirical research from a number of sources has clearly documented that mantras or chants have a direct effect upon brain processing and physiology. Certain classes of meditative mantras have been shown to have very positive physical as well as mental/emotional benefits.

Some of these benefits include: a reduction in stress hormones such as adrenaline; the lowering of respiration and heart rate; slower EEG activity (with increases in alpha and theta activity); and, in some cases, a slowing of the ageing process.

Research by Dr Herbert Benson (Harvard) has demonstrated

that almost any 'neutral' word repeated silently to oneself generates some of the benefits documented with meditative mantras. It may actually be the repetitive nature of mantras that is partially responsible for slowing down EEG in the first place. Repetitive sensory patterns affect the reticular activating system (RAS)—a network of nerve fibres in the brain that searches for novel stimuli. When a sensory pattern is repeated long enough, the RAS slows down neocortical activity and, when a new sensory pattern is introduced, the RAS stimulates the neocortex into heightened activity.

However, meditative mantras may have more subtle effects on human physiology than those created by the repetition of sound. New technologies for monitoring the actual energy fields of the body hold promise in this area. I personally suspect that the vibratory nature of certain languages, such as Sanskrit (the language of ancient India), will be documented to have numerous subtle effects—as distinct from Benson's 'neutral' words.

For the last decade or so I have focused on the use of sound to produce altered states of consciousness. It is in these states, characterised by heightened alpha and theta activity, that we have access to the more creative aspects of awareness. With the normal day-to-day sensors suspended, non-ordinary experiences can occur. Such experiences often have physically-healing, emotionally-transformative and even spiritual effects.

In much of my previous work I focused on the use of electronically-generated tonal patterns (as with tone generators) to affect both brain processing and awareness. Laboratory studies clearly showed that this method of working measurably affected the brain state. In other words, we could create a window of brain activity by directing specific pulsating sounds to the auditory system of the brain. If, for instance, I pulsed a 7-Hz signal to a subject, his or her brain activity would tend to move towards mid-theta.

Subsequent research has shown that 'entrainment' moves a subject's brainwave activity towards the same hertz (Hz, the number of cycles per second) as the entrainment frequency, but there is not necessarily an exact match.

It was in the course of this technical work that I stumbled upon a study that showed that shamanic drumming produced strong theta activity in the brain. This intrigued me, and I began to explore indigenous methods and instruments for altering consciousness.

I have found the use of shamanic sound to be a most interesting and complex system whereby consciousness itself can be directly affected. While shamanic drumming is an effective tool to alter brainwave patterns, I have found that this is greatly enhanced by using the human voice. Noted researcher Barbara Hero (MIT) has stated that the two purest forms of sound come from a pure tone generator and the human voice.

What I have found most intriguing is the ability of modulated sound, as in overtone chanting, to affect a subject's physiological processes while he or she is in an altered state of consciousness (trance).

I had a dramatic experience in this regard while teaching a class in Atlanta, Georgia, a few years ago. There was a woman who had been suffering from a compound fracture of the femur for several months. She reported that she was in constant pain and

could not put pressure on her leg. During the course of the training, I instructed almost 50 people in how to use sound for physical healing, and this woman received healing sounds from the group. Excited, she called me the next morning to report that she was without pain for the first time in months, that she could put weight upon her leg and that she was now walking without her cast!

It has been documented by some trained observers that mantras or chants can affect external events, especially weather. Tibetan yogis have been noted to produce hailstorms and fair or inclement weather just by using specific mantras. In America, some indigenous tribes have been observed to affect rain through communal dancing and chanting, even into this century.

The ethnobiologist and researcher Terence McKenna has reported how sound can seemingly alter DNA activity during trance states produced by plant hallucinogens. I personally have no doubt that this is possible, though I don't think that hallucinogenic substances are a requirement. What is required is that consciousness be more fluid in the individual.

Our day-to-day patterns of perception and action tend to be rigid and, with that, individual consciousness becomes limited. Methods for freeing up our attention or perception exist that do not rely upon hallucinogens, and this has become a research interest for me.

It is a natural next step to study the effects of shamanic sound in the laboratory, and this is what I am presently undertaking. It is an observable fact, based on hard data and clinical observation, that shamanic sound can profoundly alter brainwave activity and awareness. What

is most compelling for me is the possible scientific documentation of shamanic sound and its effects on actual physical- and micro-processes (such as genetic and neurotransmitter alterations). Here, the essential question is, "Can the purported changes in physical and neurological structure, as a result of shamanic sound, be measured—or are these changes more in the order of a mythology?" I think this question will become answerable from a scientific measurement perspective over the next 10 years.

Even as I continue to conduct and co-ordinate research into the effects of shamanic sound, I often use it clinically or in group training sessions for I have found it unsurpassed as a doorway to altered states and other dimensions of consciousness. I often witness profound emotional and physical healings occurring when people enter these non-ordinary dimensions of awareness. Touching the depth of one's nature through sound seems to have a universally transformative effect. As a researcher I continue to be intrigued by the neurological effects of sound, and as a practitioner I am continually awed by the power of sound to touch, to inspire and to heal.

About the Author:

Tom Kenyon, M.A., set up Acoustic Brain Research in 1983 in order to document scientifically the effects of sound and music on the human nervous system. He is also the author of *Brain States* (US Publishing), a critically acclaimed practical guide to the brain and its unused potentials.

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